

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

We claim:

1. A herbicide composition comprising at least one chlorinated carboxylic acid herbicide and at least one surfactant in an effective amount such that said chlorinated carboxylic acid herbicide is dissolved in the surfactant and said at least one surfactant is present in a quantity equal to or greater than said at least one chlorinated carboxylic acid herbicide.

Sub
all

2. A herbicide composition comprising at least one fully solubilized chlorinated carboxylic acid herbicide and at least about 8 weight % of at least one surfactant.

3. The herbicide composition as claimed in claim 1, which further comprises at most 25% by weight of an ester of (2,4-dichlorophenoxy)acetic acid.

4. The herbicide composition as claimed in claim 2, which further comprises at most about 15% by weight of an ester of (2,4-dichlorophenoxy)acetic acid.

5. The herbicide composition as claimed in claim 1, which further comprises at most about 10% by weight of an ester of (2,4-dichlorophenoxy)acetic acid.

- 1 6. The herbicide composition as claimed in claim 2, which further comprises
2 at most about 5% by weight of an ester of (2,4-dichlorophenoxy)acetic
3 acid.
4
- 5 7. The herbicide composition as claimed in claim 1, which further comprises
6 at most about 2% by weight of an ester of (2,4-dichlorophenoxy)acetic
7 acid.
8
- 9 8. The herbicide composition as claimed in claim 1, wherein said surfactant
10 is present in an amount of at least about 10% by weight.
11
- 12 9. The herbicide composition as claimed in claim 2, wherein said surfactant
13 is present in an amount of at least about 20% by weight.
14
- 15 10. The herbicide composition as claimed in claim 3, wherein said surfactant
16 is present in an amount of at least about 30% by weight.
17
- 18 11. The herbicide composition as claimed in claim 4, wherein said surfactant
19 is present in an amount of at least about 40% by weight.
20
- 21 12. The herbicide composition as claimed in claim 1, wherein said surfactant
22 is present in an amount of at least about 50% by weight.
23

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

21. The herbicide composition as claimed in claim 6, wherein said surfactant is present in an amount from about 50 to about 90% by weight.

22. The herbicide composition as claimed in claim 1, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

23. The herbicide composition as claimed in claim 3, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

24. The herbicide composition as claimed in claim 4, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

25. The herbicide composition as claimed in claim 5, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

26. The herbicide composition as claimed in claim 6, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

27. The herbicide composition as claimed in claim 7, wherein said surfactant is present in an amount from about 70 to about 80% by weight.

- 1 28. The herbicide composition as claimed in claim 1, wherein said chlorinated
2 carboxylic acid herbicide is present in an amount from about 1 to about
3 50% by weight.
4
- 5 29. The herbicide composition as claimed in claim 2, wherein said chlorinated
6 carboxylic acid herbicide is present in an amount from about 1 to about
7 50% by weight.
8
- 9 30. The herbicide composition as claimed in claim 3, wherein said chlorinated
10 carboxylic acid herbicide is present in an amount from about 1 to about
11 50% by weight.
12
- 13 31. The herbicide composition as claimed in claim 5, wherein said chlorinated
14 carboxylic acid herbicide is present in an amount from about 1 to about
15 50% by weight.
16
- 17 32. The herbicide composition as claimed in claim 7, wherein said chlorinated
18 carboxylic acid herbicide is present in an amount from about 1 to about
19 50% by weight.
20
- 21 33. The herbicide composition as claimed in claim 18, wherein said
22 chlorinated carboxylic acid herbicide is present in an amount from about 1
23 to about 50% by weight.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

34. The herbicide composition as claimed in claim 21, wherein said
chlorinated carboxylic acid herbicide is present in an amount from about 1
to about 50% by weight.

35. The herbicide composition as claimed in claim 22, wherein said
chlorinated carboxylic acid herbicide is present in an amount from about 1
to about 50% by weight.

36. The herbicide composition as claimed in claim 26, wherein said
chlorinated carboxylic acid herbicide is present in an amount from about 1
to about 50% by weight.

37. The herbicide composition as claimed in claim 1, wherein said chlorinated
carboxylic acid herbicide is present in an amount from about 5 to about
30% by weight.

38. The herbicide composition as claimed in claim 1, wherein said chlorinated
carboxylic acid herbicide is present in an amount from about 5 to about
30% by weight.

Sub
a2

1 39. The herbicide composition as claimed in claim 1, wherein said chlorinated
2 carboxylic acid herbicide is present in an amount from about 5 to about
3 30% by weight.
4

5 40. The herbicide composition as claimed in claim 2, wherein said chlorinated
6 carboxylic acid herbicide is present in an amount from about 5 to about
7 30% by weight.
8

9 41. The herbicide composition as claimed in claim 3, wherein said chlorinated
10 carboxylic acid herbicide is present in an amount from about 5 to about
11 30% by weight.
12

13 42. The herbicide composition as claimed in claim 5, wherein said chlorinated
14 carboxylic acid herbicide is present in an amount from about 5 to about
15 30% by weight.
16

17 43. The herbicide composition as claimed in claim 17, wherein said
18 chlorinated carboxylic acid herbicide is present in an amount from about 5
19 to about 30% by weight.
20

21 44. The herbicide composition as claimed in claim 19, wherein said
22 chlorinated carboxylic acid herbicide is present in an amount from about 5
23 to about 30% by weight.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

45. The herbicide composition as claimed in claim 21, wherein said chlorinated carboxylic acid herbicide is present in an amount from about 5 to about 30% by weight.
46. The herbicide composition as claimed in claim 22, wherein said chlorinated carboxylic acid herbicide is present in an amount from about 5 to about 30% by weight.
47. The herbicide composition as claimed in claim 26, wherein said chlorinated carboxylic acid herbicide is present in an amount from about 5 to about 30% by weight.
48. The herbicide composition as claimed in claim 1, wherein said chlorinated carboxylic acid herbicide is present in an amount from about 10 to about 20% by weight.
49. The herbicide composition as claimed in claim 2, wherein said chlorinated carboxylic acid herbicide is present in an amount from about 10 to about 20% by weight.

1 50. The herbicide composition as claimed in claim 3, wherein said chlorinated
2 carboxylic acid herbicide is present in an amount from about 10 to about
3 20% by weight.

4
5 51. The herbicide composition as claimed in claim 5, wherein said chlorinated
6 carboxylic acid herbicide is present in an amount from about 10 to about
7 20% by weight.

8
9 52. The herbicide composition as claimed in claim 7, wherein said chlorinated
10 carboxylic acid herbicide is present in an amount from about 10 to about
11 20% by weight.

12
13 53. The herbicide composition as claimed in claim 18, wherein said
14 chlorinated carboxylic acid herbicide is present in an amount from about
15 10 to about 20% by weight.

16
17 54. The herbicide composition as claimed in claim 21, wherein said
18 chlorinated carboxylic acid herbicide is present in an amount from about
19 10 to about 20% by weight.

20
21 55. The herbicide composition as claimed in claim 22, wherein said
22 chlorinated carboxylic acid herbicide is present in an amount from about
23 10 to about 20% by weight.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

56. The herbicide composition as claimed in claim 27, wherein said
chlorinated carboxylic acid herbicide is present in an amount from about
10 to about 20% by weight.

57. The herbicide composition as claimed in claim 1, which further comprises
at most 50% by weight of an aromatic solvent.

58. The herbicide composition as claimed in claim 1, which further comprises
at most 40% by weight of an aromatic solvent.

59. The herbicide composition as claimed in claim 1, which further comprises
at most 30% by weight of an aromatic solvent.

60. The herbicide composition as claimed in claim 2, which further comprises
at most 20% by weight of an aromatic solvent.

61. The herbicide composition as claimed in claim 1, which further comprises
at most 15% by weight of an aromatic solvent.

62. The herbicide composition as claimed in claim 1, which further comprises
at most 10% by weight of an aromatic solvent.

1 63. The herbicide composition as claimed in claim 1, which further comprises
2 at most 5% by weight of an aromatic solvent.

3
4 64. The herbicide composition as claimed in claim 1, which further comprises
5 at most about 10% by weight of an ester of (2,4-dichlorophenoxy)acetic
6 acid and said chlorinated carboxylic acid herbicide is present in an amount
7 from about 10 to about 20% by weight, said surfactant is present in an
8 amount from about 70 to about 80% by weight.

9
10 65. The herbicide composition as claimed in claim 64, which further
11 comprises at most 50% by weight of a solvent.

12
13 66. A herbicide composition containing a chlorinated carboxylic acid
14 herbicide and a surfactant in the ratio of acid herbicide to surfactant from
15 about 1:6 to about 1:1.
16

17 67. The herbicide as claimed in claim 1, wherein said chlorinated carboxylic
18 acid herbicide is a synthetic auxin or a quinoline carboxylic acid.

19
20 68. The herbicide as claimed in claim 3, wherein said chlorinated carboxylic
21 acid herbicide is a benzoic acid, phenoxy-carboxylic acid or pyridine
22 carboxylic acid.
23

1 69. The herbicide as claimed in claim 1, wherein said chlorinated carboxylic
2 acid herbicide is

3 Chloramben, dicamba, 2,4,5-trichlorophenoxy acetic acid, 2,4-
4 dichlorophenoxy acetic acid, 2,4-dichlorophenoxy butyric acid,
5 clomeprop, dichlorprop, dichlorprop-P, monochlorophenoxy acetic acid,
6 monochlorophenoxy butyric acid, mecoprop, mecoprop-P, clopyralid,
7 fluroxypyr, picloram, triclopyr, quinclorac or quinmerac.

8
9 70. The herbicide as claimed in claim 2, wherein said chlorinated carboxylic acid
10 herbicide is a synthetic auxin or a quinoline carboxylic acid.

11
12 71. The herbicide as claimed in claim 4, wherein said chlorinated carboxylic acid
13 herbicide is a benzoic acid, phenoxy-carboxylic acid or pyridine carboxylic
14 acid.

15
16 72. The herbicide as claimed in claim 2, wherein said chlorinated carboxylic
17 acid herbicide is

18 Chloramben, dicamba, 2,4,5-trichlorophenoxy acetic acid, 2,4-
19 dichlorophenoxy acetic acid, 2,4-dichlorophenoxy butyric acid,
20 clomeprop, dichlorprop, dichlorprop-P, monochlorophenoxy acetic acid,
21 monochlorophenoxy butyric acid, mecoprop, mecoprop-P, clopyralid,
22 fluroxypyr, picloram, triclopyr, quinclorac or quinmerac.

23

1

2

73. The herbicide as claimed in claim 1, wherein the herbicide composition
does not contain an alkylated fatty acid.

3

4

5

74. The herbicide as claimed in claim 1, wherein the herbicide composition
does not contain an alkylated plant derived oil.

6

7

8

75. The herbicide as claimed in claim 1, wherein the herbicide composition
does not contain an alkylated animal derived oil.

9

10

11

76. The herbicide as claimed in claim 1, wherein the herbicide composition
does not contain an alkylated fatty acid, alkylated plant derived oil and an
alkylated animal derived oil.

12

13

14

15

16

77. The herbicide as claimed in claim 2, wherein the herbicide composition
does not contain an alkylated fatty acid.

17

18

78. The herbicide as claimed in claim 2, wherein the herbicide composition
does not contain an alkylated plant derived oil.

19

20

21

78. The herbicide as claimed in claim 2, wherein the herbicide composition
does not contain an alkylated animal derived oil.

22

23

1 79. The herbicide as claimed in claim 2, wherein the herbicide composition
2 does not contain an alkylated fatty acid, alkylated plant derived oil and an
3 alkylated animal derived oil.

4
5 81. A process to produce a herbicidal composition which comprises
6 blending a fully solubolized acid herbicide with a surfactant to form a
7 solution provided that said chlorinated carboxylic acid herbicide and
8 surfactant are present in an amount of about 1 part by weight of chlorinated
9 carboxylic acid herbicide to at least about 1.5 part by weight of surfactant.

10
11 82. The herbicide as claimed in claim 1, which further comprises at least one
12 of the following additional components selected from the group consisting
13 of

14 Methylated fatty acids,

15 Ethylated fatty acids,

16 Butylated fatty acids,

17 Alkylated soybean oil,

18 Alkylated canola oil,

19 Alkylated coconut oil,

20 Alkylated sunflower oil,

21 Mineral oils,

22 Vegetable oils,

23 Fatty acids,

1 Polybutenes and

2 Epoxified seed oils.

3 83. The herbicide as claimed in claim 1, which further comprises at least one
4 of the following additional components selected from the group consisting
5 of

6 Methylated C6-C19 fatty acids,

7 Methylated Tall oil fatty acids,

8 Methylated Oleic acid,

9 Methylated Linoleic acid,

10 Methylated Linolenic acid,

11 Methylated Stearic acid,

12 Methylated Palmitic acid,

13 Ethylated C6-C19 fatty acids,

14 Ethylated Tall oil fatty acids,

15 Ethylated Oleic acid,

16 Ethylated Linoleic acid,

17 Ethylated Linolenic acid,

18 Ethylated Stearic acid,

19 Ethylated Palmitic acid,

20 Butylated C6-C19 fatty acids,

21 Butylated Tall oil fatty acids,

22 Butylated Oleic acid,

23 Butylated Linoleic acid

1	Butylated Linolenic acid,
2	Butylated Stearic acid,
3	Butylated Palmitic acid,
4	Methylated soybean oil,
5	Ethylated soybean oil,
6	Butylated soybean oil,
7	Methylated canola oil,
8	Ethylated canola oil,
9	Butylated canola oil,
10	Methylated coconut oil,
11	Ethylated coconut oil,
12	Butylated coconut oil,
13	Methylated sunflower oil,
14	Ethylated sunflower oil,
15	Butylated sunflower oil,
16	Paraffinic mineral oils,
17	Naphthenic mineral oils,
18	Aromatic mineral oils,
19	Soybean oil,
20	Canola oil,
21	Cottonseed oil,
22	C6-C19 fatty acids,
23	Tall oil fatty acids,

1 Oleic acid,
2 Linoleic acid,
3 Linolenic acid,
4 Stearic acid,
5 Palmitic acid and
6 Epoxified soybean oil.
7

8 84. The herbicide as claimed in claim 2, which further comprises at least one of
9 the following additional components selected from the group consisting of

10 Methylated fatty acids,
11 Ethylated fatty acids,
12 Butylated fatty acids,
13 Alkylated soybean oil,
14 Alkylated canola oil,
15 Alkylated coconut oil,
16 Alkylated sunflower oil,
17 Mineral oils,
18 Vegetable oils,
19 Fatty acids,
20 Polybutenes and
21 Epoxified seed oils.

22 ⁸⁵
~~84.~~ The herbicide as claimed in claim 2, which further comprises at least one

- 1 of the following additional components selected from the group consisting
- 2 of
- 3 Methylated C6-C19 fatty acids,
- 4 Methylated Tall oil fatty acids,
- 5 Methylated Oleic acid,
- 6 Methylated Linoleic acid,
- 7 Methylated Linolenic acid,
- 8 Methylated Stearic acid,
- 9 Methylated Palmitic acid,
- 10 Ethylated C6-C19 fatty acids,
- 11 Ethylated Tall oil fatty acids,
- 12 Ethylated Oleic acid,
- 13 Ethylated Linoleic acid,
- 14 Ethylated Linolenic acid,
- 15 Ethylated Stearic acid,
- 16 Ethylated Palmitic acid,
- 17 Butylated C6-C19 fatty acids,
- 18 Butylated Tall oil fatty acids,
- 19 Butylated Oleic acid,
- 20 Butylated Linoleic acid
- 21 Butylated Linolenic acid,
- 22 Butylated Stearic acid,
- 23 Butylated Palmitic acid,

1	Methylated soybean oil,
2	Ethylated soybean oil,
3	Butylated soybean oil,
4	Methylated canola oil,
5	Ethylated canola oil,
6	Butylated canola oil,
7	Methylated coconut oil,
8	Ethylated coconut oil,
9	Butylated coconut oil,
10	Methylated sunflower oil,
11	Ethylated sunflower oil,
12	Butylated sunflower oil,
13	Paraffinic mineral oils,
14	Naphthenic mineral oils,
15	Aromatic mineral oils,
16	Soybean oil,
17	Canola oil,
18	Cottonseed oil,
19	C6-C19 fatty acids,
20	Tall oil fatty acids,
21	Oleic acid,
22	Linoleic acid,
23	Linolenic acid,

1 Stearic acid,
2 Palmitic acid and
3 Epoxified soybean oil.

4 ⁸⁶ 85. The herbicide as claimed in claim 1, wherein the at least one surfactant is
5 selected from the group consisting of

6 Alcohol alkoxylate,
7 Alcohol alkoxylate sulfate,
8 Alkylphenol alkoxylate,
9 Alkanolamide,
10 Alkylaryl sulfonate,
11 Amine oxide,
12 Amine,
13 Betaine derivative,
14 Block polymers of ethylene and propylene glycol,
15 Carboxylated alcohol or alkylphenol alkoxylate,
16 Diol,
17 Diphenyl sulfonate derivative,
18 Ether,
19 Ethoxylated amine,
20 Ethoxylated fatty acid,
21 Ethoxylated fatty ester and oils,
22 Ethylene carbonate,
23 Fatty ester,
24 Glycerol ester,

- 1 Glycol,
2 Phosphate ester surfactant,
3 Propylene Carbonate,
4 Sarcosine derivative,
5 Silicone-based surfactant,
6 Sorbitan derivative,
7 Sucrose derivative,
8 glucose derivative,
9 Sulfate of alkoxylated alkylphenol ,
10 sulfonate of alkoxylated alkylphenol,
11 Sulfate of alcohol and
12 Tristyrylphenol Alkoxylate.

- 13
14
15 86. The herbicide as claimed in claim 1, wherein the at least one surfactant is
16 selected from the group consisting of
17 A) Alcohol alkoxylates based on branched and linear alcohols containing ethylene
18 oxide or propylene oxide
19 B) Alcohol alkoxylate sulfates,
20 C) Nonylphenol alkoxylate containing ethylene oxide,
21 D) Nonylphenol alkoxylate containing propylene oxide,
22 E) Octylphenols alkoxylate containing ethylene oxide
23 F) Octylphenols alkoxylate containing propylene oxide,
24 G) Fatty amine alkoxylates,

- 1 H) Butanediols,
2 I) Butyl cellulose ether,
3 J) Butyl carbitol,
4 K) Propylene glycol,
5 L) Ethylene glycol,
6 M) Dipropylene glycol,
7 N) Diethylene glycol,
8 O) Phosphate esters of alcohol alkoxylates,
9 P) Phosphate esters of alkylphenol alkoxylates,
10 Q) Sorbitan esters,
11 R) Alkoxylated sorbitan esters and
12 S) Alkylpolyglucosides,

- 13
14 ⁸⁶ 87. The herbicide as claimed in claim 2, wherein the at least one surfactant is
15 selected from the group consisting of
16 Alcohol alkoxylate,
17 Alcohol alkoxylate sulfate,
18 Alkylphenol alkoxylate,
19 Alkanolamide,
20 Alkylaryl sulfonate,
21 Amine oxide,
22 Amine,
23 Betaine derivative,
24 Block polymers of ethylene and propylene glycol,

- 1 Carboxylated alcohol or alkylphenol alkoxylate,
- 2 Diol,
- 3 Diphenyl sulfonate derivative,
- 4 Ether,
- 5 Ethoxylated amine,
- 6 Ethoxylated fatty acid,
- 7 Ethoxylated fatty ester and oils,
- 8 Ethylene carbonate,
- 9 Fatty ester,
- 10 Glycerol ester,
- 11 Glycol,
- 12 Phosphate ester surfactant,
- 13 Propylene Carbonate,
- 14 Sarcosine derivative,
- 15 Silicone-based surfactant,
- 16 Sorbitan derivative,
- 17 Sucrose derivative,
- 18 glucose derivative,
- 19 Sulfate of alkoxylated alkylphenol ,
- 20 sulfonate of alkoxylated alkylphenol,
- 21 Sulfate of alcohol and
- 22 Tristyrylphenol Alkoxylate,
- 23
- 24

1 88. The herbicide as claimed in claim 2, wherein the at least one surfactant is
2 selected from the group consisting of

3 A) Alcohol alkoxylates based on branched and linear alcohols containing ethylene
4 oxide or propylene oxide

5 B) Alcohol alkoxylate sulfates,

6 C) Nonylphenol alkoxylate containing ethylene oxide,

7 D) Nonylphenol alkoxylate containing propylene oxide,

8 E) Octylphenols alkoxylate containing ethylene oxide

9 F) Octylphenols alkoxylate containing propylene oxide,

10 G) Fatty amine alkoxylates,

11 H) Butanediols,

12 I) Butyl cellulose ether,

13 J) Butyl carbitol,

14 K) Propylene glycol,

15 L) Ethylene glycol,

16 M) Dipropylene glycol,

17 N) Diethylene glycol,

18 O) Phosphate esters of alcohol alkoxylates,

19 P) Phosphate esters of alkylphenol alkoxylates,

20 Q) Sorbitan esters,

21 R) Alkoxylated sorbitan esters and

22 S) Alkylpolyglucosides.

23 89. The herbicide as claimed in claim 68, wherein the at least one surfactant is
24 selected from the group consisting of

- 1 Alcohol alkoxylate,
- 2 Alcohol alkoxylate sulfate,
- 3 Alkylphenol alkoxylate,
- 4 Alkanolamide,
- 5 Alkylaryl sulfonate,
- 6 Amine oxide,
- 7 Amine,
- 8 Betaine derivative,
- 9 Block polymers of ethylene and propylene glycol,
- 10 Carboxylated alcohol or alkylphenol alkoxylate,
- 11 Diol,
- 12 Diphenyl sulfonate derivative,
- 13 Ether,
- 14 Ethoxylated amine,
- 15 Ethoxylated fatty acid,
- 16 Ethoxylated fatty ester and oils,
- 17 Ethylene carbonate,
- 18 Fatty ester,
- 19 Glycerol ester,
- 20 Glycol,
- 21 Phosphate ester surfactant,
- 22 Propylene Carbonate,
- 23 Sarcosine derivative,

- 1 Silicone-based surfactant,
- 2 Sorbitan derivative,
- 3 Sucrose derivative,
- 4 glucose derivative,
- 5 Sulfate of alkoxylated alkylphenol ,
- 6 sulfonate of alkoxylated alkylphenol,
- 7 Sulfate of alcohol and
- 8 Tristyrylphenol Alkoxylate,

9

10

11 ⁹¹~~90.~~ The herbicide as claimed in claim 71, wherein the at least one surfactant is
12 selected from the group consisting of

13 A) Alcohol alkoxylates based on branched and linear alcohols containing ethylene
14 oxide or propylene oxide

15 B) Alcohol alkoxylate sulfates,

16 C) Nonylphenol alkoxylate containing ethylene oxide,

17 D) Nonylphenol alkoxylate containing propylene oxide,

18 E) Octylphenols alkoxylate containing ethylene oxide

19 F) Octylphenols alkoxylate containing propylene oxide,

20 G) Fatty amine alkoxylates,

21 H) Butanediols,

22 I) Butyl cellulose ether,

23 J) Butyl carbitol,

24 K) Propylene glycol,

- [illegible]